

[Print](#)[Close](#)

Marshall Star, March 14, 2012 Edition

MARSHALL STAR

In This Week's Star  ([Click to Expand](#))

- › [Returning Teams and Rookies Ready to Compete for a Top-Three Finish at NASA's Great Moonbuggy Race April 13-14](#)
- › [Payload Operations Center Marks 11th Anniversary at Marshall with New 'Tweets'](#)
- › [J-2X Development Engine 10001 Returns to Stennis' A-2 Test Stand for Second Round of Testing](#)
- › [NASA Chief Technologist Dr. Mason Peck and Space Technology Program Director Michael Gazarik Tour CFD Research, Hudson Alpha, Marshall Center](#)
- › [The Secrets Within Galaxy Cluster Abell 520](#)
- › [Marshall Participates in Alabama State University Historically Black Colleges and Universities Entrepreneurship Conference](#)
- › [Let's Play Ball: MARS Softball Club Season Begins April 16](#)
- › [MARS Soccer Club Spring Season Kicks Off March 19](#)
- › [Obituaries](#)

Returning Teams and Rookies Ready to Compete for a Top-Three Finish at NASA's Great Moonbuggy Race April 13-14

By Megan Davidson

Hand-sketched designs cover dozens of sheets of paper. Wheels, brackets and bolts are hammered and welded. An excited group of students are ready to show off their creativity, and are craving a bit of competition.

Image right: A team from the Rhode Island School of Design in Providence pedals through a bumpy patch of the course at the 2010 NASA Great Moonbuggy Race. The school will join some 100 returning and rookie student teams at this year's competition. (NASA/MSFC)

That's how it all began for students at three schools -- Cameron University in Lawton, Okla.; the Huntsville Center for Technology; and the



Rhode Island School of Design in Providence -- when they joined the ranks of rookie teams in NASA's Great Moonbuggy Race in 1997, 2002 and 2009, respectively. Since those first years of their competition, their designs for the specially crafted lunar rovers or "moonbuggies" have been repeatedly modified, their moonbuggies' parts tinkered with and altered, and, of course, their team members have changed.

But that initial excitement each student team experienced has proven a timeless constant as they compete year after year with other teams, all after the same goal: a first-place victory.

Approximately 100 returning and rookie teams from around the world will join these now-seasoned competitors in the battle for a top finish at the 19th-annual NASA Great Moonbuggy Race on April 13-14 at the U.S. Space & Rocket Center.

More than 500 high school, college and university students from 20 states and Puerto Rico, Canada, Germany, Russia, United Arab Emirates, Italy and India are expected to participate in the race.

Students begin to prepare for the event each year during the fall semester. They must design, build and test a sturdy, collapsible, lightweight vehicle that addresses engineering problems similar to those overcome by the original Apollo-era lunar rover development team in the late 1960s at the Marshall Space Flight Center.

The buggies are based on the design of those classic rovers, which American astronauts drove across the moon's surface during the Apollo 15, 16 and 17 missions in the early 1970s. Teams of students build their vehicles using trail bike tires, aluminum or composite-metal struts and parts.

"We do most of the work on our moonbuggy in our precision machining and welding classes," said Tim White, who has been students' moonbuggy mentor at the Huntsville Center for Technology since 2002. The school will have two teams in this year's race. "We get some of our other technical classes involved, too, to help with assembly and painting," he said. "It's a lot of fun for these kids."

"We have a school-wide assembly in September and show a video of the previous year's race to attract new students to participate in the competition," White added. "Anyone can sign up and register. Then we have our own moonbuggy competition -- using our old buggies and plotting out a course on the school grounds -- to determine who will be on our teams. Whoever has the fastest time gets to be a team member."

"I think the important thing is to get these kids out there and see what work in the 'real world' is like. They thrive on the challenge of turning a concept drawing on paper towels and napkins into a finished product. Good things definitely happen when we all work together. That's just something they can't get in a classroom."

Each moonbuggy is human-powered by two students -- one female and one male -- over a half-mile simulated lunar terrain course that includes "craters," rocks, "lava," ridges, inclines and "lunar" soil.

Moonbuggy entries are expected to be like a "proof-of-concept" or engineering test model, rather than final production model. Each student team of six members is responsible for building its own buggy, and the vehicle's drivers -- chosen from each team -- must be among the moonbuggy's builders.

"We are making major modifications to the buggy we used last year," said Mark Polson, the mentor for the Cameron University team since 2007. "Our main goal is to reduce the weight of the buggy."

The Cameron team has several new members working on those modifications. When it comes to recruiting new team members each year for the race, communication is key as seniors reach out to younger classmates to recruit them into the competition. Most moonbuggy team members are also members of the university's computer-aided-design drafting club, Polson said.

"Engineering is hard work but so rewarding," he added. "These kids get excited about building something from scratch and enjoy getting to know students with similar interests from other schools. I think that's what brings them back year after year."

Michael Lye, mentor since 2010 of the Rhode Island School for Design team, agrees. "Our team comes from our industrial design program. The challenge of designing and building something, and then competing against other schools, gives them a chance to see their hard work in action. It is a great learning experience for them -- going from design to actual fabrication."

This will be the first year the Rhode Island team includes sophomores, as well as juniors and seniors. Lye said the school also is involving students majoring in other fields, hoping to use their wider range of skill sets for their buggy's development.

"The moonbuggy race is a big deal at our school," Lye said. "We are the only art design school in the competition, which makes us unique from the other teams. I think that also pushes our students to do a good job. It is a great way to learn."

As a part of the competition, and prior to course testing, the unassembled moonbuggy entries must be carried to the course starting line with the unassembled components contained in a box that is 4 feet long, 4 feet wide and 4 feet high -- dimensions similar to those required for the original Lunar Roving Vehicle. At the starting line, the buggies will be assembled and readied for course testing and evaluated for safety. Assembly occurs one time prior to the first course run.

"At last year's race, our team had to make last-minute modifications to our buggy to make it fit that box," Lye said. "We are making significant changes to our buggy so that doesn't happen again this year."

Top prizes are awarded to the three teams in both the high school and college/university divisions that post the fastest race times, which include assembly and penalty times.

"We haven't placed in the top three yet," said Polson. "That's a big goal for us this year."

A variety of other prizes are given by corporate race sponsors. These include "rookie of the year" and the "American Institute of Aeronautics and Astronautics Telemetry/Electronics Award" award. The latter is a new award this year, for the team that develops and operates the most innovative and most useful real-time telemetry system -- used to track data on the moonbuggy's performance at the race.

NASA's Great Moonbuggy Race is one of many educational projects and initiatives the agency conducts each year to attract and engage America's next generation of scientists, engineers and explorers.

"This race has really opened our students' eyes to all their career possibilities -- including those at NASA -- where their talents can shine," Lye said. "Five of our alumni have gone on to work at the Johnson Space Center. The competition really fits in beautifully with our curriculum and gets our students enthusiastic about technical careers."

The race is sponsored by the Human Exploration & Operations Mission Directorate in Washington. Major corporate sponsors are Lockheed Martin Corp., The Boeing Company, Northrop Grumman Corporation and Jacobs Engineering ESTS Group, all with operations in Huntsville. Other corporate and institutional contributors include Science Applications International Corp. of Huntsville; ATK Aerospace Systems of Salt Lake City, Utah; Davidson Technologies, Teledyne Brown Engineering, Booz-Allen Hamilton and Stanley Associates, all of Huntsville; the American Institute of Aeronautics and Astronautics; and the Systems Safety Society's Tennessee Valley Chapter.

For more information about the competition, visit <http://moonbuggy.msfc.nasa.gov>.

Davidson, an AI Signal Research Inc. employee, supports the Office of Strategic Analysis & Communications.

[› Back to Top](#)

Payload Operations Center Marks 11th Anniversary at Marshall with New 'Tweets'

By Lori Meggs



They plan, coordinate and execute research on the International Space Station, and now you can add tweeting to the list of duties for the Payload Operations Center team at the Marshall Space Flight Center.

Image left: NASA's Payload Operations Center in Building 4663 at the Marshall Space Flight Center provides the heartbeat for International Space Station research operations. (NASA/MSFC/Fred Deaton)

As the team marks its 11th anniversary supporting the space station, its members are giving an insider's look to followers on Twitter at how it all comes together to support the station science operations and crew.

The Payload Operations Center went online as the science command post for the space station March 8, 2001, linking Earth-bound researchers with their experiments -- or payloads -- in orbit. Since then, the Payload Operations Center team has worked with 1,309 scientific investigators, performing 1,251 research investigations. It's a job that entails processing hundreds of payload commands per day. Those commands are transmitted to the station as fast as eight per second.

"We thought it would be really interesting for not only the Marshall team, but the general public to gain insight into what goes on behind the scenes in payload operations," said Sam Digesu, manager of the Payload Operations Directors Office at Marshall. "We are extremely excited that, in addition to the hard work they perform each and every day for the crews aboard the station, the payload operations directors have volunteered to tweet about it. That really says a lot about their dedication and wanting to get the word out about the challenging job we have performed for the station over the past 11 years."

In addition to managing all NASA science operations, the Payload Operations Center team plans the crew time and other valuable resources required to accommodate the experiments, including those of the Canadian Space Agency, European Space Agency and Japan Aerospace Exploration Agency.

You can follow the Payload Operations Center on Twitter with the handle @ISS_ScienceOps.

Meggs, an AI Signal Research Inc. employee, supports the Office of Strategic Analysis & Communications.

[› Back to Top](#)

J-2X Development Engine 10001 Returns to Stennis' A-2 Test Stand for Second Round of Testing

The first J-2X development engine -- E10001 -- is returning to the A-2 Test Stand at NASA's Stennis Space Center for its second round of tests. The developmental engine underwent an initial series of tests last year. Both the engine and test stand have been modified to begin simulated altitude testing in the coming months. The J-2X engine is designed and built by Pratt & Whitney Rocketdyne for the Marshall Space Flight Center. It is the first human-rated liquid oxygen and liquid hydrogen rocket engine to be developed in 40 years. The J-2X will provide upper-stage power for NASA's Space Launch System, a new heavy-lift launch vehicle capable of missions beyond low-Earth orbit. (NASA/SSC)



[› Back to Top](#)

NASA Chief Technologist Dr. Mason Peck and Space Technology Program Director Michael Gazarik Tour CFD Research, Hudson Alpha, Marshall Center



NASA Chief Technologist Dr. Mason Peck, right, visiting Huntsville from NASA Headquarters, is being briefed on some of CFD Research Corp.'s newest technologies from the firm's Matthew Thomas, center, vice president of propulsion and power; and Dr. Andrzej Przekwas, chief technology officer. Peck, accompanied by NASA Space Technology Program Director Michael Gazarik, toured the company's Huntsville facility March 8. CFD Research, a woman-owned company, develops technologies and provides innovative solutions for aerospace and defense, biomedical and life sciences, energy, materials and other industries. It has received numerous NASA

Small Business Innovation Research awards to develop software solutions that both enable NASA missions and have potential for commercial applications. The NASA Small Business Innovation Research Program is a highly competitive, three-phase award system which provides qualified small business concerns with opportunities to propose innovative ideas that meet the specific research and development needs of the federal government. "When we invest in technology, we enable small business," said Peck. "And small businesses, in turn, create jobs. That's good for all of us." Peck and Gazarik also visited the Hudson Alpha Institute in Huntsville; toured several Marshall Center test facilities; met with Marshall senior management personnel; and were briefed on propulsion research. (NASA/MSFC/Emmett Given)

[› Back to Top](#)

The Secrets Within Galaxy Cluster Abell 520

From www.nasa.gov

This composite image, right, shows the distribution of dark matter, galaxies, and hot gas in the core of the merging galaxy cluster Abell 520, formed from a violent collision of massive galaxy clusters located about 2.4 billion light years from Earth.

Data from the Marshall Space Flight Center-managed Chandra X-ray Observatory shows the hot gas in the colliding clusters colored in green. The gas provides evidence that a collision took place. Optical data from NASA's Hubble Space Telescope and the Canada-France-Hawaii Telescope, or CFHT, in Hawaii is shown in red, green and blue. Starlight from galaxies within the clusters, derived from observations by the CFHT and smoothed to show the location of most of the galaxies, is colored orange.



The blue-colored areas pinpoint the location of most of the mass in the cluster, which is dominated by dark matter. Dark matter is an invisible substance that makes up most of the universe's mass. The dark-matter map was derived from the Hubble observations, by detecting how light from distant objects is distorted by the cluster galaxies, an effect called gravitational lensing. The blend of blue and green in the center of the image reveals that a clump of dark matter resides near most of the hot gas, where very few galaxies are found.

This finding confirms previous observations of a dark-matter core in the cluster announced in 2007. The result could present a challenge to basic theories of dark matter, which predict that galaxies should be anchored to dark matter, even during the shock of a powerful collision.

(NASA, ESA, CFHT, CXO, M.J. Jee (University of California, Davis), and A. Mahdavi (San Francisco State University))

[› Back to Top](#)

Marshall Participates in Alabama State University Historically Black Colleges and Universities Entrepreneurship Conference



Marshall Space Flight Center Associate Center Director (Technical) Dale Thomas, in photo at left, provides a center overview briefing, while Marshall employees, in right photo, from left, Elaine Flowers Duncan, Lewis Wooten, Charles Nola, Lynn Garrison and Tammy Rowan, participate in the Alabama State University Historically Black Colleges and Universities Entrepreneurship Conference in Montgomery on March 5-7. Conference attendees learned about business development,

Let's Play Ball: MARS Softball Club Season Begins April 16

Opening day for the 2012 MARS Softball Club season is April 16.

Games will be played at 5 and 6 p.m. on the NASA field -- south of Building 4203 -- Monday through Thursday, and at the Redstone Arsenal field -- near the intersection of Patton and Gray roads -- Tuesday and Thursday until August. Typically, each team plays one game per week.

All Marshall civil service employees, onsite contractors, approved offsite contractors and family members are eligible to participate.

This year, Redstone civil service employees and dependents are invited to join. There will be a 10-team limit for Redstone employees, so space is limited. The league expects the 20 teams from last year to return. This is a 50 percent increase in the size of the club.

The three divisions are:

Division A - Intermediate/Competitive, Mixture of Skilled/Intermediate players

Division B - Co-ed Intermediate Skilled Players

Division C - Co-ed Beginner League

Co-ed teams require a minimum of two females on the field.

The Softball Club is looking for new players and teams. For questions or to sign up, contact Jim Lomas, softball club president, at jim.lomas@nasa.gov or at 544-8305; or Scott Ringel, league commissioner, at scott.ringel@nasa.gov or at 544-4195.

The official kickoff and team signup meeting is March 27.

For more information about the club, Marshall team members can visit <https://explornet.msfc.nasa.gov/groups/softball-club?view=overview>.

MARS Soccer Club Spring Season Kicks Off March 19

The MARS Soccer Club will begin its spring season March 19.

Games will be played at 5:30 p.m. on the NASA soccer field near the Wellness Center on Digney Road. The days played will be determined by the number of people who sign up. Anyone who has access to Redstone Arsenal is invited to participate.

Prospective new players should call Jon Patterson at 961-5870 or David Wells at 213-2206.

Elmer Dewey Bartlett, 90, of Toney died Feb. 25. He retired from the Marshall Center in 1974 as an aerospace engineering technician. He is survived by his wife, Kathryn Bartlett.

B. Nolen Taylor, 85, of Huntsville died Feb. 27. He retired from the Marshall Center in 1988 as a systems accountant supervisor. He is survived by his wife, Ruby Taylor.

Robert R. Head, 92, of Titusville, Fla., died Feb. 29. He retired from the Marshall Center in 1974 as a propulsion systems engineer. He is survived by his wife, Isabella Head.

Jewell Green Belcher Jr., 77, of Huntsville died March 4. He retired from the Marshall Center in 1999 as a materials engineer. He is survived by his wife, Barbara Mears Belcher.

Dale Strider, 81, of Hartselle died March 6. He retired from the Marshall Center in 1995 as an aerospace engineer. He is survived by his wife, Gayle Connor Strider.

Charles Franklin Lewis, 79, of Meridianville died March 8. He retired from the Marshall Center in 1990 as an engineering technician.

Jack E. Churchey, 75, of Huntsville died March 10. He retired from the Marshall Center in 1991 as an electronics technician. He is survived by his wife, Glenda Churchey.

Find this article at:

<http://www.nasa.gov/centers/marshall/about/star/index.html>